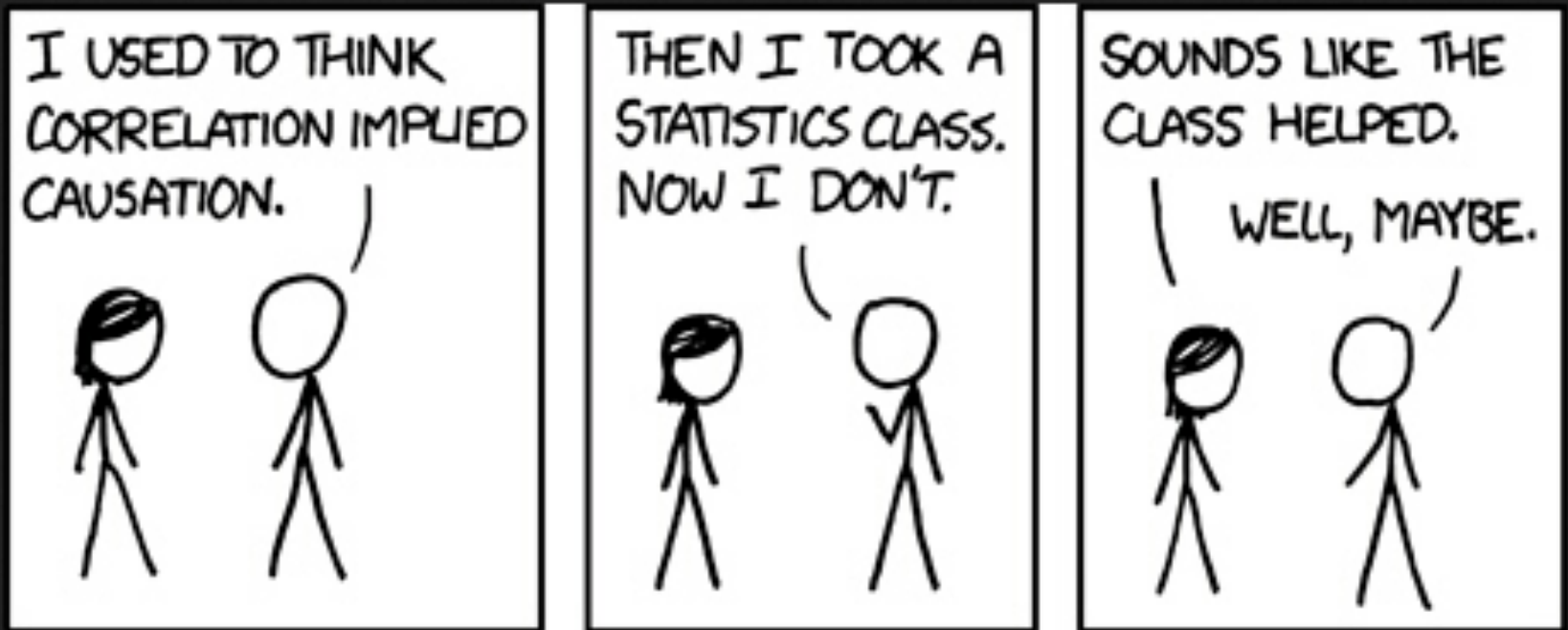# Social Scientific Frameworks For Guiding the Use of Social Media and Big Data in Hyperlocal Human Dynamics Research

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August 11, 2015

Why theory?

Why MORE theory?

- *"Just as the telescope enabled us to comprehend the universe and the microscope allowed us to understand germs, the new techniques for collecting and analyzing huge bodies of data will help us make sense of our world in ways we are just starting to appreciate."*

  (Mayer-Schönberger & Cukier, 2013*)*

How do we get more theory?

- Emerging technologies such as social media and new methodologies for analyzing big data

  – Re-examine established frameworks and cultivate new ones

Some Possibilities

- Social Amplification of Risk Framework (SARF)
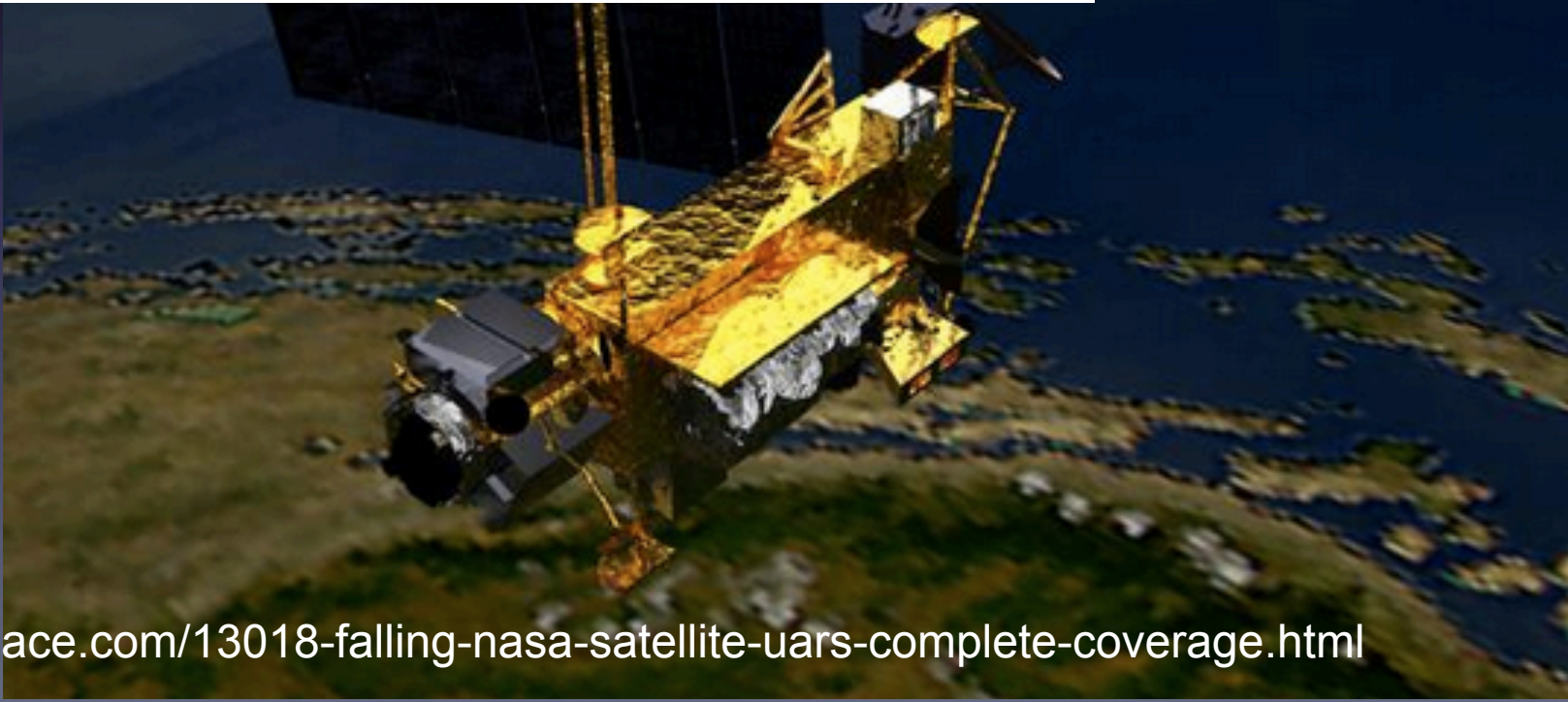
- M3D

- Social Network Theory (SNT)

SARF

- Distortion in public's responses to experts' evaluation of hazard risks

  – Risk amplification or intensification

SARF

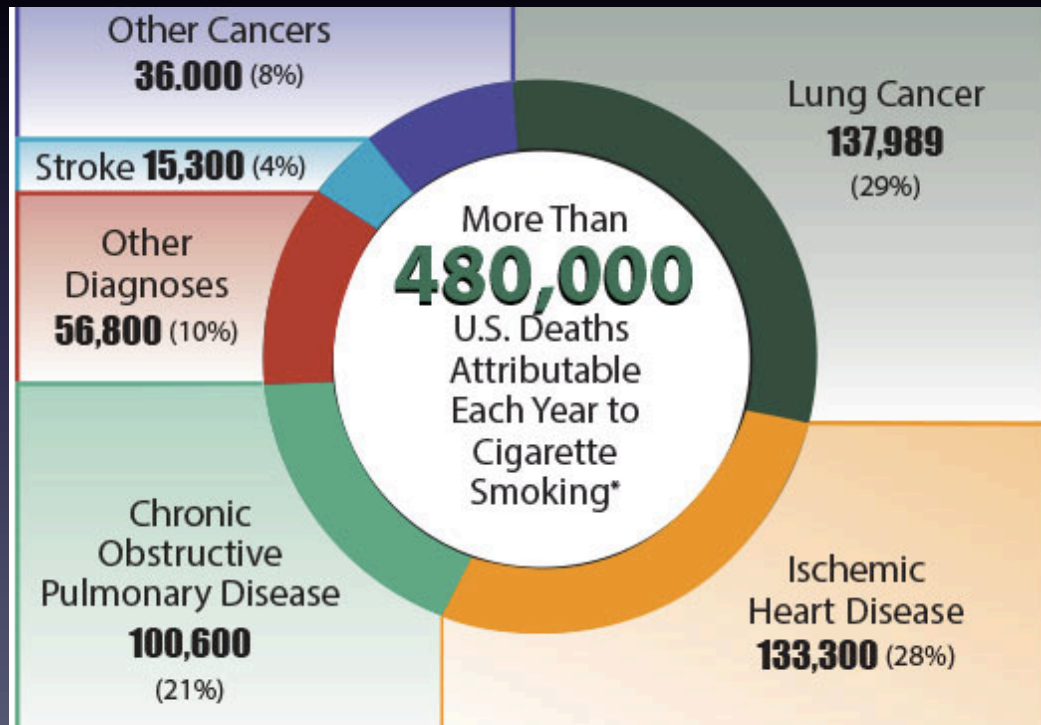**Complete Coverage of NASA's Falling Satellite UARS**

SPACE.com Staff | September 27, 2011 01:30pm ET

http://www.space.com/13018-falling-nasa-satellite-uars-complete-coverage.html

SARF

Annual Deaths Attributable to Cigarette Smoking—United States, 2005–2009

Other Cancers 36,000 (8%)

Stroke 15,300 (4%)

Other Diagnoses 56,800 (10%)

Lung Cancer 137,989 (29%)

More Than 480,000 U.S. Deaths Attributable Each Year to Cigarette Smoking*

Chronic Obstructive Pulmonary Disease 100,600 (21%)

Ischemic Heart Disease 133,300 (28%)

http://www.surgeongeneral.gov/library/reports/50-years-of-progress/sgr50-chap-12.pdf

SARF &
Hyperlocal Human Dynamics

- Algorithms based on keywords

- Layer with existing data

- Develop profiles for targeting intervention efforts

M3D

- How a meme is diffused through various levels within a social system

M3D

M3D &
Hyperlocal Human Dynamics

http://vision.sdsu.edu/hdma/smart/flu2

DON'T GET THE FLU. DON'T SPREAD THE FLU.

GET VACCINATED.

cdc.gov/flu

M3D &
Hyperlocal Human Dynamics

http://vision.sdsu.edu/hdma/smart/flu2
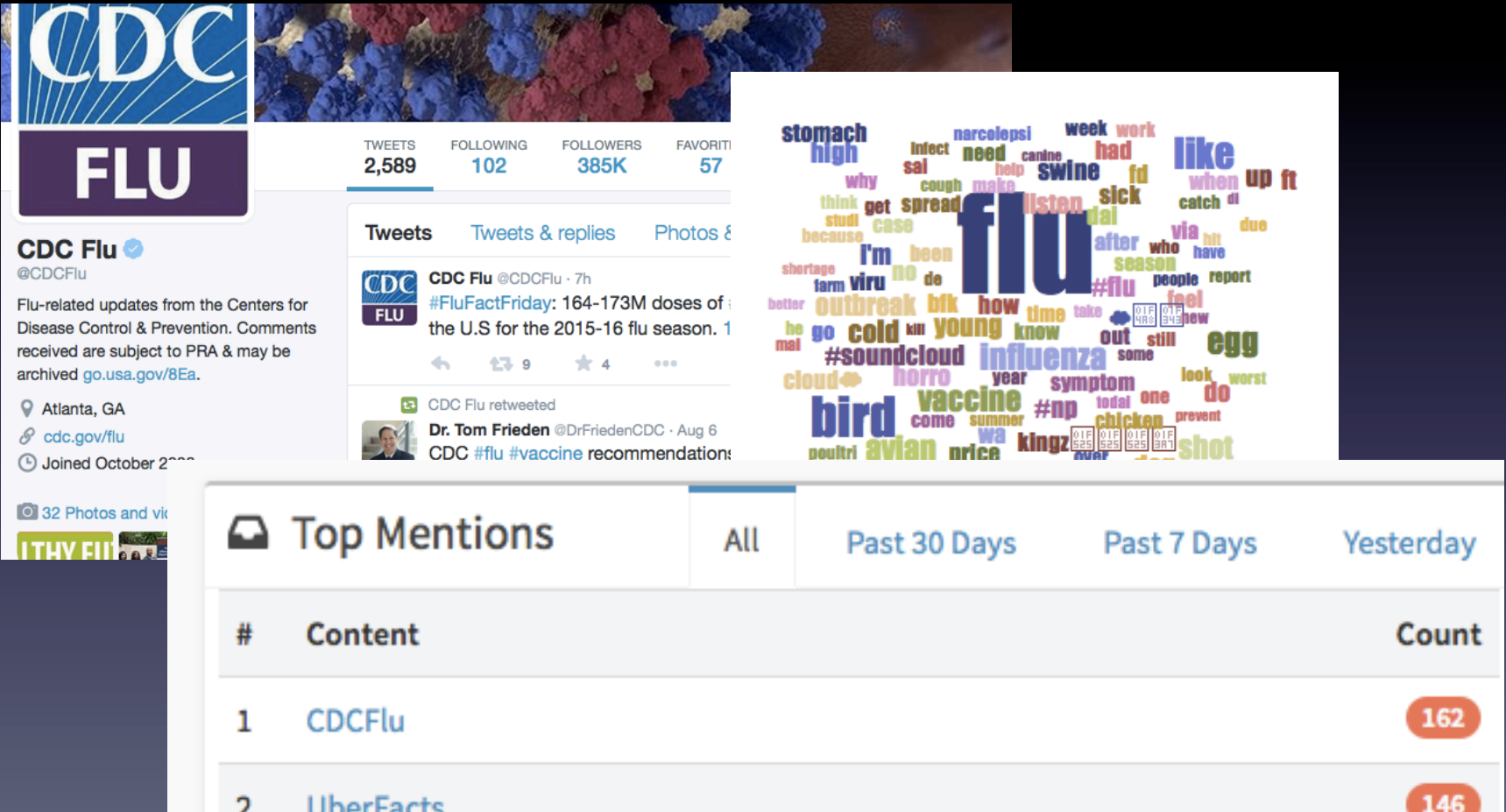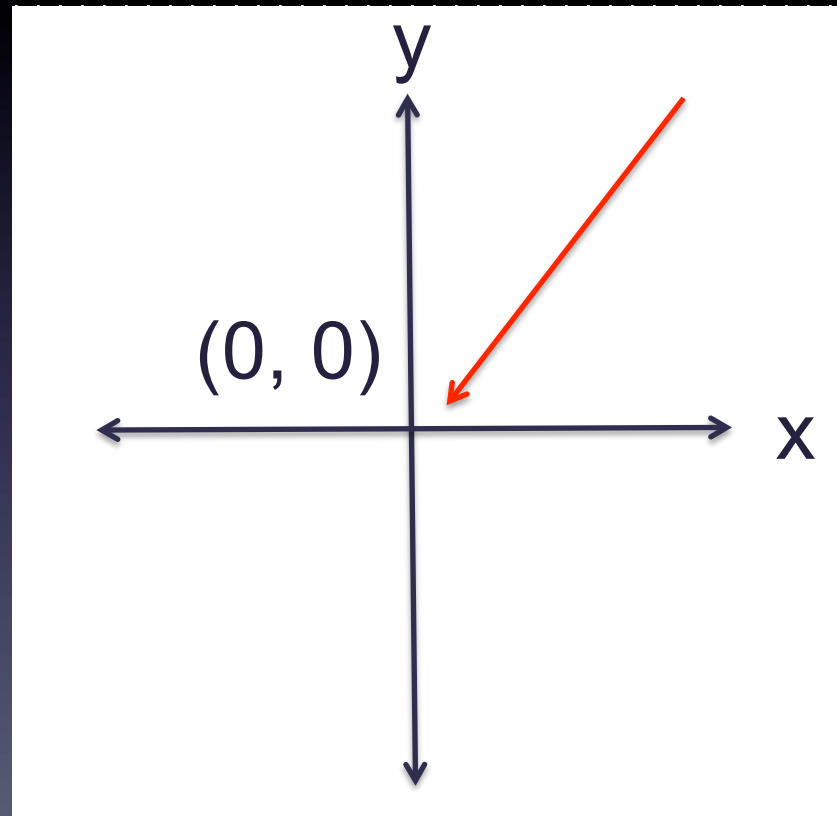
M3D &
Hyperlocal Human Dynamics

SNT

- Focuses on processes that explain effects of network properties
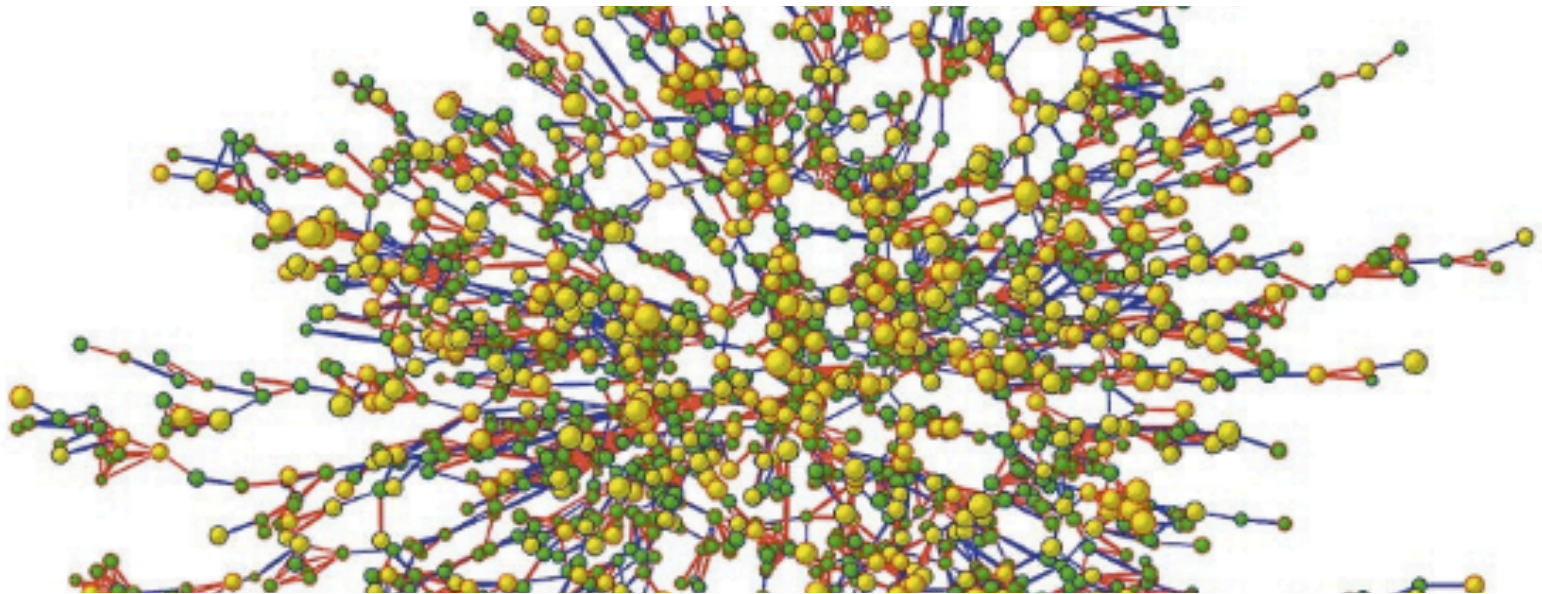
Level of Effects

- Individual

- Network

- Individual x Network

Individual Level Effects

TIME

Obesity Is Contagious, Study Finds

By LAURA BLUE | Wednesday, July 25, 2007
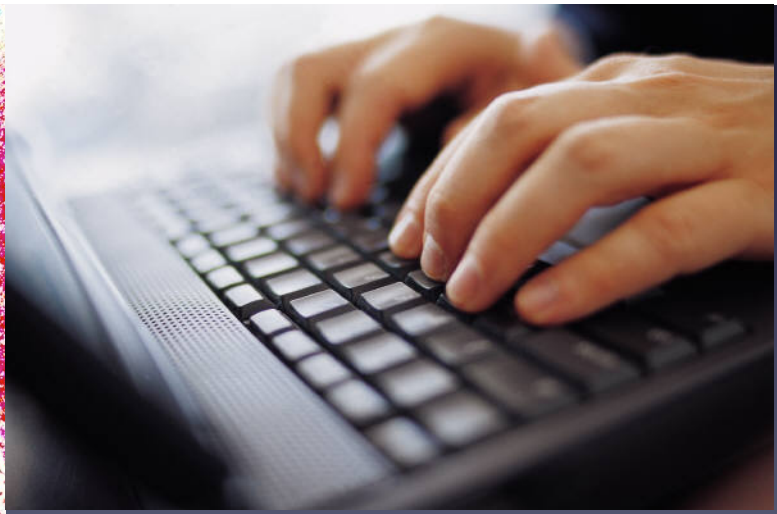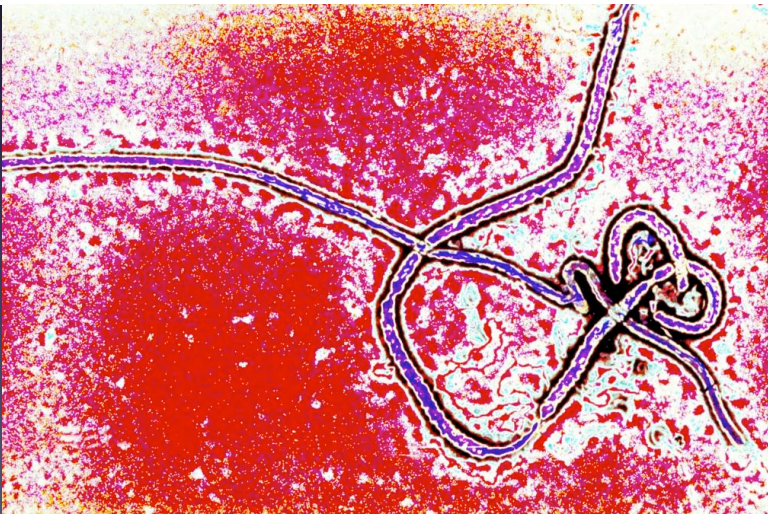
September 13, 2009

The New York Times

Are Your Friends Making You Fat?

Network Level Effects

TIME

Fear, Misinformation, and Social Media Complicate Ebola Fight

https://timedotcom.files.wordpress.com/2015/02/128581294-copy.jpg?quality=65&strip=color&w=1012

Individual x Network Effects

Los Angeles Times — Study links teenage bullying to social status

Social Network Analysis (SNA)

"Premise that social life is created primarily and most importantly by relations and patterns formed by these relations"

(Marin & Wellman, 2011, p. 11)

SNT/SNA & Hyperlocal Human Dynamics

- Identify and compare network properties in geographically defined communities, observing how they change over time

- Measure and map flow mechanisms within and between geographical communities

In sum…

- Theory arguably more important than ever in big data era

- Social science theories have much to offer in terms of guiding human hyperlocal dynamics research